

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Revisions to Broadcast Auxiliary Service Rules in)	ET Docket No. 01-75
Part 74 and Conforming Technical Rules for)	
Broadcast Auxiliary Service, Cable Television)	
Relay Service and Fixed Services in Parts 74, 78)	
and 101 of the Commission's Rules)	
)	
Telecommunications Industry Association,)	RM-9418
Petition for Rule Making Regarding Digital)	
Modulation for the Television Broadcast Auxiliary)	
Service)	
)	
Alliance of Motion Picture and Television)	RM-9856
Producers, Petition for Rule Making Regarding)	
Low-Power Video Assist Devices in Portions of)	
the UHF and VHF Television Bands)	

REPLY COMMENTS OF MICROWAVE RADIO COMMUNICATIONS

Microwave Radio Communications, LLC ("MRC") hereby submits these reply comments in response to the above-captioned Notice of Proposed Rulemaking ("NPRM"), FCC 01-92, 66 Fed. Reg. 28686. MRC is a manufacturer of analog and digital Electronic NewsGathering ("ENG"), Studio-to-Transmitter Links ("STL") and Inter-city Relay ("ICR") microwave equipment. We have served the broadcast industry continuously since 1964 and have been the leading supplier of Broadcast Auxiliary Service ("BAS") microwave equipment throughout that period.

Summary of Position

The analog emission mask should continue to apply to portable ENG microwave links, because the more-stringent digital mask does not provide enough flexibility during the transition from analog to digital and from wider to narrower ENG channels. The digital mask would raise broadcasters' costs and decrease their ability to provide full news coverage throughout their service area.

Emission Mask

We reiterate our position that the analog emission mask of Section 74.637(a) should apply to portable pickup microwave radios, rather than the digital mask of Section 101.111(a)(2)(i). The digital mask is much more stringent because it requires at least a 50 dB attenuation at the channel edge while the analog mask requires a 25 dB attenuation. There are several reasons that the analog mask should be applicable. First, this is a time of transition for the TV broadcast industry and its vendors. It is a time of transition from analog to digital modulation. And it is a time of transition among varying bandwidths for portable ENG links, because the 2 GHz ENG channels will be narrowed as 2 GHz Mobile Satellite systems are deployed. Manufacturers and broadcasters must have sufficient flexibility in technical rules to manage this transition in a way that is both economically and spectrally efficient. The analog emission mask will provide that flexibility, but the digital mask will not.

Moreover, for portable ENG operations, the emission mask does not play as strong a role in mitigating interference as it does in a fixed link environment. For portable operations, operators will use antenna polarity, channel +/- offsets, IF filter selection and local frequency co-ordinators to help to minimize the adjacent channel performance and achieve the microwave shot. The emission mask is very important in those cases where two fixed links operate along the same path in a planned link, but not so important for portable and mobile links.

The digital mask would increase broadcasters' costs by making the equipment more expensive than necessary, and it would reduce equipment performance to the extent that a broadcaster might be unable to achieve the coverage distances that are now achievable with 2 GHz analog radios. At some point in the future, when the transition is ended and the digital ENG microwave technology has matured, a more stringent emission mask might be appropriate. But for now, it would be premature.

Interference Protection Criteria

We take this opportunity to clarify our brief discussion of adjacent channel interference that appeared on page 4 of our comments, and the validity of TIA Bulletin TSB 10 interference criteria. In general for analog radios, the undesired adjacent channel power can be about the same as the desired channel power ($C/I = 0$ dB) and the undesired co-channel power must be about 50 dB lower ($C/I = +50$ dB). On this basis, TIA Bulletin TSB 10 provides acceptable interference criteria. For digital radios using the same modulation, roughly the same is true, and again TIA Bulletin TSB 10 would be acceptable for fixed BAS links using traditional digital modulation methods such as studio-to-transmitter links.

But for digital radios employing vastly different modulation methods and coding techniques, for example 16 QAM vs. COFDM, the results can be very different, because different digital modulation methods have very different noise and interference thresholds. Thus, Bulletin TSB 10 takes into consideration coding gain, modulation and bit rate, and refers to the equipment manufacturers for C/I requirements.

However, the Bulletin TSB 10 protection criteria do not take into account radios like the TwinStream that consist of an analog subchannel and a digital subchannel that are multiplexed together. In the TwinStream, the digital subchannel is above the analog subchannel, and it is possible to measure and compute separate C/I protection ratios into the TwinStream analog and digital subchannels. Here are typical results that we have measured in the laboratory for adjacent channel protection ratios for interference into the TwinStream:

Undesired Signal	Location of Undesired	C/I required to protect analog	C/I required to protect digital
TwinStream	upper adjacent	-48 dB	-1 dB
TwinStream	lower adjacent	- 3 dB	-38 dB
Analog FM	upper adjacent	-52 dB	- 6 dB
Analog FM	lower adjacent	-26 dB	-32 dB

In this table, an entry like -48 dB means that the interfering signal can be 48 dB stronger than the desired TwinStream signal.

Thus, we have found that the TwinStream is, in the worst case, about as resistant to adjacent channel interference as traditional radios, and in the best case can be much more resistant.

Emission Designators

We disagree with the position of the Society of Broadcast Engineers that would require a dual emission designator for the TwinStream radio. SBE incorrectly characterizes the TwinStream as a radio with two separate transmitters, like a TV station has a visual transmitter and an aural transmitter. MRC disagrees with this analogy. The TwinStream employs frequency division multiplexing to combine two different baseband signals, and then transmits them using a single transmitter. Consequently, a single emission designator is proper.

Conclusion

In light of these considerations, the Commission should retain the analog emission mask for portable digital ENG microwave links for the time being until the broadcast industry has worked thru it's transition from analog to digital modulation and the reduction of 2 Ghz BAS channels.

Respectfully submitted,

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